(54) Title: A SYSTEM FOR THE COMPRESSION, ENCODING, AUTHORING, AND ENCRYPTION OF DATA AND MEDIA THE STORAGE OF SUCH CONTENT IN EXTERNAL MOBILE TELEPHONE OR PERSONAL DIGITAL ASSISTANT COMPATIBLE MEMORY DEVICES
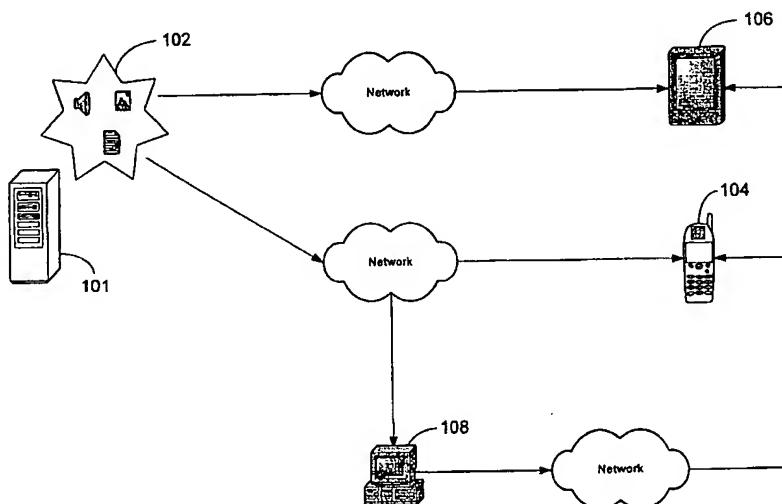
(57) Abstract: A unique combination of compression, encoding, authoring, and encryption software practices to store large data and media files (102) onto external mobile handset (104) and PDA (106) compatible memory devices. The unique combination allows for a copy protected handset (104) and PDA (106) compatible external memory device with pre-installed data and media. A multimedia player is also written in the external memory device along with the processed data and/or media files, wherein the multimedia player is used to render the stored data and/or media files (102) in a mobile device such as an external mobile handset (104) or PDA (106). The memory device is inserted into a mobile handset (104) or PDA (106) for access by a user.

A System for the Compression, Encoding, Authoring, and Encryption of Data and Media the Storage of Such Content in External Mobile Telephone or Personal Digital Assistant Compatible Memory Devices

BACKGROUND OF THE INVENTION

Related Applications

The present application claims the benefit of provisional patent application entitled "A System and Method for Compressing, Encoding, Authoring, and Encrypting Data Content and Media, and the Application of Such Content to External Mobile Telephone Compatible or Personal Digital Assistant Compatible Memory Devices", Serial number 60/612,536, filed September 24, 2004, now pending, which is hereby incorporated by reference.

Field of Invention

The present invention relates to the compression, encoding, authoring, and encryption of data and audio/video content for application in external memory devices and, more specifically, in external memory devices compatible for use with mobile handsets, such as mobile telephones (handsets) and Personal Digital Assistants (PDAs).

Discussion of Prior Art

Currently blank third-party memory devices, such as flash drives, are manufactured for personal storage of media and data that are either too large to

done over the wireless Web or using other transmission schemes that are compatible with the mobile device (e.g., WAP or GPRS).

In the indirect deliver scenario, the data/media file(s) is first transferred from the remote location (e.g., server **101**) to an intermediate computer (such as a computer located at a home or office) **108**. Such a transfer is usually done over a network such as the Internet. Next, the data/media file(s) is transferred from the intermediate computer **108** to the mobile handsets **104** or PDA **106**. The transfer of data from the intermediate computer **108** to the mobile device **104** or **106** is usually done either wirelessly (e.g., Bluetooth) or via a connection such as a USB cable. A problem with both scenarios described in figure 1 is that the data transfer process does not ensure protection of copyrights.

In addition to the copyright protection disadvantage of prior art, there are numerous consumer disadvantages. For example, there is no teaching in the prior art for simplifying the multimedia experience in a portable memory device using a user menu and branded front page or "splash page" from which the consumer may choose to view all of the media in a particular order, or any other combination or sequence they desire. Furthermore, the prior art also fails to provide for a memory device that comes with a pre-loaded media player, such that if the memory device is purchased, the user is guaranteed access the media using the pre-loaded player.

Whatever the precise merits, features, and advantages of the above mentioned prior art, none of them achieves or fulfills the purposes of the present invention.

5   SUMMARY OF THE INVENTION

The present invention provides for a method to store data and multimedia files onto external memory devices for use with mobile devices (e.g., PDAs or handhelds), wherein the method comprising the steps of: (a) receiving multimedia data such as video, audio, multimedia data (wherein such data can be received over

10   a network such as the Internet or extracted from an optical disk such as a DVD); (b) encoding and compressing the received multimedia data in a format compatible with at least one mobile device; (c) authoring a multimedia asset with a menu based on the encoded and compressed multimedia data; (d) transferring a media player and the authored multimedia asset onto at least one external memory device;

15   and (e) encrypting the transferred multimedia asset in the external memory device(s). The stored multimedia asset is accessible when the external memory device (with the encrypted multimedia asset) is used in conjunction with a compatible mobile device (such as being inserted in a compatible device). For example, the Treo 600™ memory device uses the SanDisc™ brand external

20   memory device. The unique result is the recreation of a consumer experience that is commonly found only on optical video discs such as DVDs.

The present invention also provides for a method to apply data and multimedia files onto external memory devices for use with mobile devices(e.g., PDAs or handhelds), wherein the method comprises the steps of: (a) extracting multimedia content and menu data from an optical disk (e.g., DVD disk); (b)

5   encoding the menu data in a format compatible with at least one mobile device; (c) encoding and compressing the extracted multimedia data in a format compatible with at least one mobile device; (d) authoring a multimedia asset with the encoded menu data based on the encoded and compressed multimedia data; (e) transferring the authored multimedia asset onto at least one external memory device along with

10   a multimedia player to playback the authored multimedia asset; and (f) encrypting the transferred multimedia asset in the external memory device(s). The multimedia asset is accessible when the external memory device with the encrypted multimedia asset is used in conjunction with a compatible mobile device (such as being inserted in a memory slot of a portable phone or PDA).

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        The present invention also provides for an external memory device for use with at least one mobile device, wherein the external memory device comprises a storage area storing menu data, storage area storing audio data, storage area storing video data, and storage area storing an embedded multimedia player to playback in

20   a compatible mobile device the audio and video data, wherein the menu, audio, and video data are created and written onto the external memory device based on

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encoding, compressing, authoring, and encrypting corresponding data stored in an optical disk.

PCT/US2004/036725

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates two common means (direct and indirect) via which data (e.g., multimedia data) is transferred from a remote location (e.g., a server) to a mobile device, such as a mobile phone or a PDA.

5   Figure 2 illustrates a general overview of the unique combination as taught by the present invention.

Figure 3 illustrates an exemplary method associated with the present invention.

Figure 4 illustrates the present invention's method for re-encoding

10   multimedia data along with menus.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

While this invention is illustrated and described in a preferred embodiment, the invention may be produced in many different configurations. There is depicted

15   in the drawings, and will herein be described in detail, a preferred embodiment of the invention, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and the associated functional specifications for its construction and is not intended to limit the invention to the embodiment illustrated. Those skilled in the art will envision

20   many other possible variations within the scope of the present invention.

The present invention provides for a system and method that utilize a unique combination of compression, encoding, authoring, and encryption software and practices to store large data and media files onto external mobile handset and PDA compatible memory devices. The resulting handset and PDA compatible

5   external memory device is a copy protected device with pre-installed data and media. A user is able to access the content by inserting the copy protected memory device into a handset or PDA.

Figure 2 illustrates a general overview of the unique combination as taught

10   by the present invention. In step **202**, the data and/or media file(s) is compressed and encoded in a format compatible with the destination mobile device. It should be noted that in the preferred embodiment, encoding is done in synchronicity with compression. Furthermore, in one example, the media/video assets are encoded/compressed two-ways as generic 3GPP content or as Kinoma files for

15   compatibility with Palm devices. In step **204**, the compressed/encoded data is authored via a multimedia software tool, and in step **208**, the authored data is encrypted and is made ready for storage in a portable memory device. In the preferred embodiment, authoring is done via a standard authoring application with the output being exported in an interactive 3GPP format or Kinoma format. In one

20   specific example, the authored data comprises the multimedia data, a selection menu, and an embedded media player to render the multimedia data. In the preferred embodiment, encryption is handled by the built-in digital rights

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management of MPEG4 or 3GPP content. In another embodiment, the memory is set in a read only format.

5   In the current invention, applications such as (but not limited to) Apple's Final Cut Pro®, Final Cut Express®, QuickTime Pro®, iMovie®, Adobe GoLive®, Discreet Cleaner® and other applications that use architecture such as the QuickTime® architecture are used to encode, author, and compress the data and media (which includes any combination of audio, video, and text data) into files such as 3GPP and 3GPP2 compatible files. The files are then transferred from the
10   computer to an external port where the memory device is written uniquely encrypted for copy protection.

Figure 3 illustrates an exemplary method associated with the present invention. As shown in step **302**, a master copy of the original media or data asset
15   is provided as a digital file. The digital file can be sent as a hard copy on computer storage medium that includes any of, but is not limited to, the following: CD-ROM, DVD, magnetic tape, optical disc, hard drive, floppy disk, ferroelectric memory, flash memory, ferromagnetic memory, optical storage, charge coupled devices, magnetic or optical cards, smart cards, EEPROM, EPROM, RAM, ROM,
20   DRAM, SRAM, SDRAM, or any other appropriate static or dynamic memory, writable memory device, or data storage devices. Alternatively, the digital file can be received from a remote location over a network such as the Internet.

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It should be noted that audio/video assets can also be provided on a VHS or

Cassette tape. As shown in step **304**, if the master file is provided on a VHS or

Cassette tape, the asset is reformatted into a digital file via an analog-to-digital

5   conversion process.

In step **306**, the original asset is encoded, authored, and compressed into a

format such as (but not limited to) 3GPP and 3GPP2 format, using a program such

as (but not limited to) a QuickTime® based program.

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In step **308**, the file is then transferred from the CPU/server to the external

port housing the blank memory device where the media or data is applied.

Following application of the data or media to the memory device, in **310**,

15   encryption is applied and, in **312**, the copy protected device is ready to be used

with a portable device (such as a mobile handset or PDA). It should be noted that

once encryption is applied to the external memory device, it is copy protected and

cannot be altered.

20   Figure 4 illustrates the present invention's method for re-encoding

multimedia data along with menus. In this embodiment, the copy protected

memory device stores an encrypted version of a movie along with menus such as

menus commonly found on DVDs. In step **402**, the menus are extracted along with the links from the source disk (e.g., source DVD disk) **401** and, in step **404**, the extracted menu is re-encoded along with the links. In step **406**, multimedia data (e.g., video and audio data) is extracted from the source disk **408**, and the extracted

5 multimedia data is encoded/compressed in a format compatible with the destination mobile device (e.g., PDA or handset). In step **410**, the newly encoded menu with links and corresponding encoded/compressed multimedia data is authored using a multimedia authoring tool, and in step **412** are written to the copy protected memory device. In the preferred embodiment, the authored multimedia asset, the

10 newly encoded menu, and an embedded media player (for rendering the multimedia data) are transferred onto the external memory device. Next, in step **414**, the transferred data is encrypted using an encryption algorithm.

In this embodiment, the user of a portable device with such a copy

15 protected memory device experiences the same visual effects (e.g., menus, etc.) as a user experiencing the playback of a DVD disk in a stand alone player. In one embodiment, branded logos, animated and non-animated, are used prior to the menu being displayed to the user. In an extended embodiment, an information screen is shown when a logo is clicked by the user. In another embodiment, the

20 menu page has a play link, an instruction menu, and content of disc. In the preferred embodiment, the animation graphics are prepared in Macromedia Flash^{TM} format for deployment as 3GPPP content.

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Additionally, the present invention provides for an article of manufacture comprising computer readable program code contained within implementing one or more modules to compress, encode, author, and encrypt data and media file(s) for

5   storage in external mobile telephone or PDA compatible memory devices. Furthermore, the present invention includes a computer program code-based product, which is a storage medium having program code stored therein which can be used to instruct a computer to perform any of the methods associated with the present invention. The computer storage medium includes any of, but is not

10 limited to, the following: CD-ROM, DVD, magnetic tape, optical disc, hard drive, floppy disk, ferroelectric memory, flash memory, ferromagnetic memory, optical storage, charge coupled devices, magnetic or optical cards, smart cards, EEPROM, EPROM, RAM, ROM, DRAM, SRAM, SDRAM, or any other appropriate static or dynamic memory or data storage devices.

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Implemented in computer program code based products are software modules for: (a) aiding in the extraction of multimedia data from an source such as a DVD disk; (b) encoding and compressing multimedia data (such as data from the DVD) in a format compatible with at least one mobile device; (c) authoring a

20 multimedia asset with a menu based on said encoded and compressed multimedia data; (d) aiding in the transfer of a media player and said authored multimedia asset with said menu onto at least one external memory device, wherein the media player

chosen to ensure playback of the multimedia asset with the menu; and (e) encrypting the transferred multimedia asset in the external memory device(s), wherein the multimedia asset is accessible when said external memory device, with the encrypted multimedia asset, is used in conjunction with a compatible mobile

5   device.

Also implemented in computer program code based products are software modules for: (a) extracting multimedia content and menu data from a storage medium (such as an optical disk); (b) encoding the menu data in a format

10   compatible with at least one mobile device; (c) encoding and compressing the received multimedia data in a format compatible with at least one mobile device; (d) authoring a multimedia asset based on the encoded menu data and the encoded and compressed multimedia data; (e) aiding in the transfer of the authored multimedia asset onto an external memory device along with a multimedia player

15   to playback the authored multimedia asset; and (f) encrypting said transferred multimedia asset in said external memory device, wherein the multimedia asset is accessible when the external memory device with the encrypted multimedia asset is used in conjunction with a compatible mobile device.

20   CONCLUSION

A system and method has been shown in the above embodiments for the effective implementation of a system and method for the compression, encoding,

authoring, and encryption of data and media file(s), and the application of such content in external memory devices associated with module devices (e.g., mobile phones, PDAs). While various preferred embodiments have been shown and described, it will be understood that there is no intent to limit the invention by such disclosure, but rather, it is intended to cover all modifications falling within the spirit and scope of the invention, as defined in the appended claims. For example, the present invention should not be limited by type of memory device, type of compression scheme used, type of encoding scheme used, type of multimedia authoring tool used, type of multimedia playback player used, type of mobile device, type of data encryption used, file formats, specific software/program, computing environment, or specific computing hardware.

The above enhancements are implemented in various computing environments. For example, the present invention may be implemented on a conventional IBM PC or equivalent, multi-nodal system (e.g., LAN) or networking system (e.g., Internet, WWW, wireless web). All programming and data related thereto are stored in computer memory, static or dynamic, and may be retrieved by the user in any of: conventional computer storage, display (i.e., CRT) and/or hardcopy (i.e., printed) formats. The programming of the present invention may be implemented by one of skill in the art of digital rights management, compression schemes, encoding schemes, encryption schemes, and multimedia editing.

CLAIMS

1.   A method to store data and multimedia files onto external memory devices for use with mobile devices, said method comprising the steps of:

(a) receiving multimedia data;

(b) encoding and compressing said received multimedia data in a format compatible with at least one mobile device;

(c) authoring a multimedia asset with a menu based on said encoded and compressed multimedia data;

(d) transferring a media player and said authored multimedia asset with said menu onto at least one external memory device, said media player chosen to ensure playback of multimedia asset with said menu;

(e) encrypting said transferred multimedia asset in said at least one external memory device, and

wherein said multimedia asset is accessible when said at least one external memory device, with said encrypted multimedia asset, is used in conjunction with a compatible mobile device.

2.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per claim 1, wherein said multimedia data in step (a) is received over a network.

3.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per claim 2, wherein said network is any of the following: local area network (LAN), wide area network (WAN), wireless network, cellular network, or the Internet.

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4.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per claim 1, wherein said multimedia data in step (a) corresponds to data extracted from an optical disk.

10   5..   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per clam 4, wherein said optical disk is a DVD.

6.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per claim 1, wherein said multimedia data

15   comprises video data, audio data, and menu data.

7.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per claim 1, wherein said multimedia data is data associated with a multimedia score card.

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8.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per claim 1, wherein said multimedia data is data associated with a video game.

5   9.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per claim 1, wherein when said multimedia is stored in an analog format, said method further comprises the step of performing a analog-to-digital conversion prior to said encoding and compression step (b).

10   10.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per claim 1, wherein said mobile device is any of the following: a personal digital assistant (PDA) or a mobile handset.

11.   An external memory device for use with at least one mobile device, said

15   external memory device comprising:

storage region storing audio data;

storage region storing video data;

storage region fstoring menu data;

storage region storing an embedded media player to playback in a

20   compatible mobile device said audio and video data, and

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wherein said menu, audio, and video data are created and written onto said

external memory device based on encoding, compressing, authoring, and

encrypting corresponding data stored in an optical disk.

12.   An external memory device as per claim 11, wherein said optical disk is a

DVD containing a movie, a television show, or a long or short form of video.

13.   An external memory device as per claim 11, wherein said mobile device is

any of the following: a personal digital assistant (PDA) or a mobile handset.

14.   A method to store data and multimedia files onto external memory devices

for use with mobile devices, said method comprising the steps of:

(a) extracting multimedia content and menu data from a storage medium;

(b) encoding said menu data in a format compatible with at least one

mobile device;

(c) encoding and compressing said received multimedia data in said format

compatible with at least one mobile device;

(d) authoring a multimedia asset based on said encoded menu data and said

encoded and compressed multimedia data;

(e) transferring said authored multimedia asset onto at least one external

memory device with a multimedia player to playback said authored multimedia

asset;

(f) encrypting said transferred multimedia asset in said at least one external memory device, and

wherein said multimedia asset is accessible when said at least one external memory device with said encrypted multimedia asset is used in conjunction with a

5   compatible mobile device.

15.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per clam 14, wherein said storage medium is an optical disk.

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16.   A method to store data and multimedia files onto external memory devices for use with mobile devices, as per clam 15, wherein said optical disk is a DVD.

17.   A method to store data and multimedia files onto external memory devices

15   for use with mobile devices, as per claim 14, wherein said multimedia content and menu data are associated with a movie, a television show, or a long or short form of video.

18.   A method to store data and multimedia files onto external memory devices

20   for use with mobile devices, as per claim 14, wherein said mobile device is any of the following: a personal digital assistant (PDA) or a mobile handset.

19.   An article of manufacture comprising a computer user medium having computer readable program code embodied therein which implements a method to store data and multimedia files onto external memory devices for use with mobile devices, said medium comprising:

(a) computer readable program code extracting multimedia data;

(b) computer readable program code encoding and compressing said received multimedia data in a format compatible with at least one mobile device;

(c) computer readable program code authoring a multimedia asset with a menu based on said encoded and compressed multimedia data;

(d) computer readable program code aiding in the transfer of a media player and said authored multimedia asset with said menu onto at least one external memory device, said media player chosen to ensure playback of multimedia asset with said menu;

(e) computer readable program code encrypting said transferred multimedia asset in said at least one external memory device, and

wherein said multimedia asset is accessible when said at least one external memory device, with said encrypted multimedia asset, is used in conjunction with a compatible mobile device.

20.   An article of manufacture comprising a computer user medium having computer readable program code embodied therein which implements a method to

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store data and multimedia files onto external memory devices for use with mobile

devices, said method comprising the steps of:

(a) computer readable program code aiding in the extraction of multimedia

content and menu data from an optical disk;

5   (b) computer readable program code encoding said menu data in a format

compatible with at least one mobile device;

(c)   computer readable program code encoding and compressing said

received multimedia data in said format compatible with at least one mobile

device;

10   (d) computer readable program code authoring a multimedia asset based on

said encoded menu data and said encoded and compressed multimedia data;

(e) computer readable program code aiding in the transfer of said authored

multimedia asset onto at least one external memory device with a multimedia

player to playback said authored multimedia asset;

15   (f) computer readable program code encrypting said transferred multimedia

asset in said at least one external memory device, and

wherein said multimedia asset is accessible when said at least one external

memory device, with said encrypted multimedia asset, is used in conjunction with a

compatible mobile device.

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FIGURE 1

FIGURE 2

FIGURE 3

1a
Analog-to-Digital Conversion

304

1
Master Received

302

306
Encoding,
Authoring and Compression
2

310
Encryption Applied to
External Memory Device
4

312
5
Product Complete

3
Media/Data Transfer to
External Memory Device

308
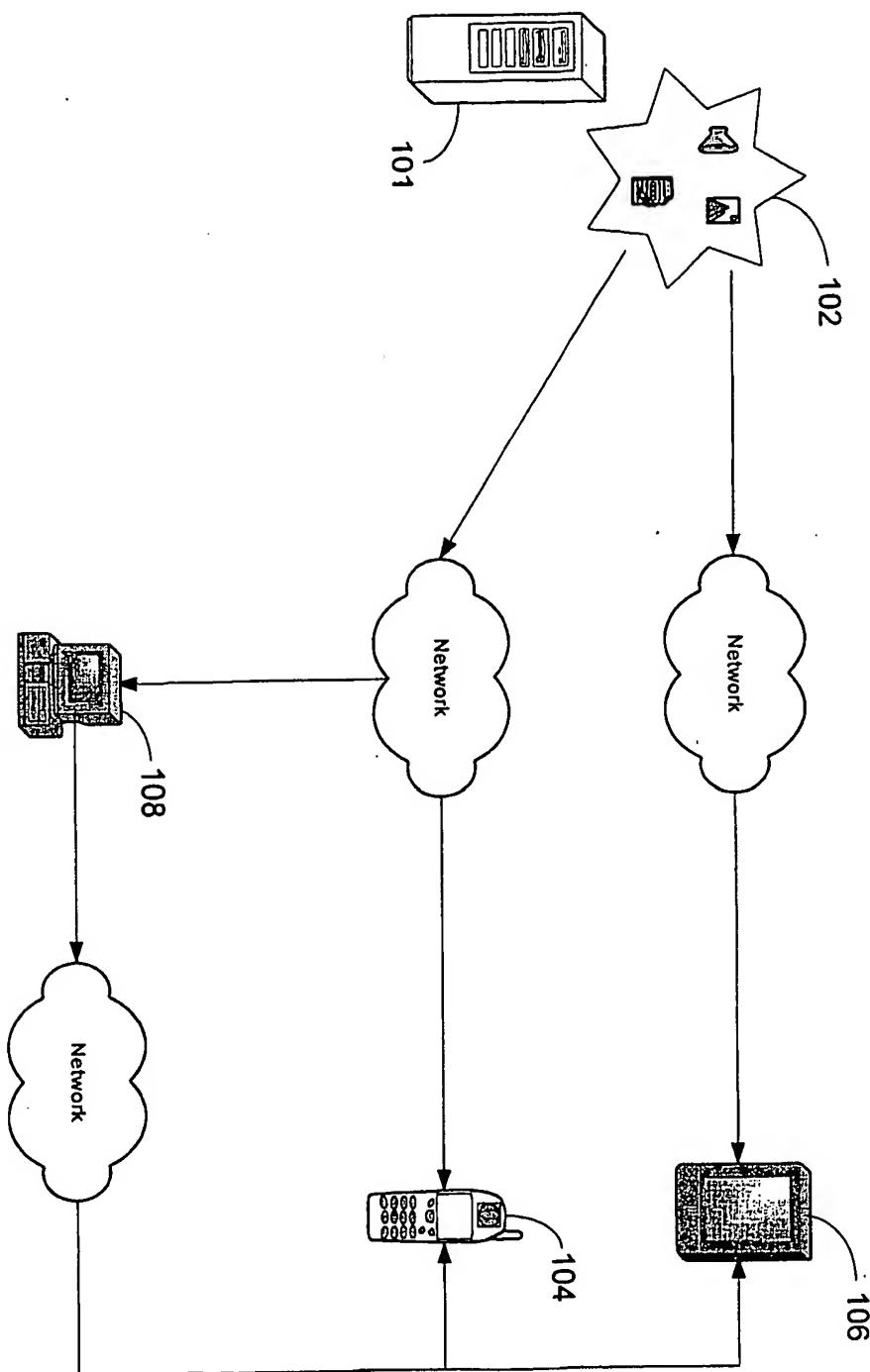
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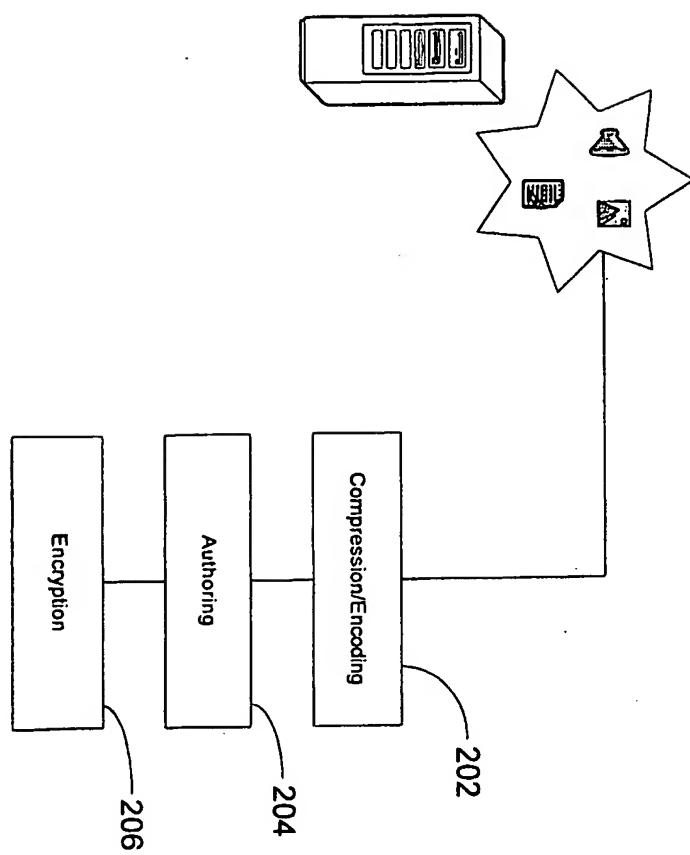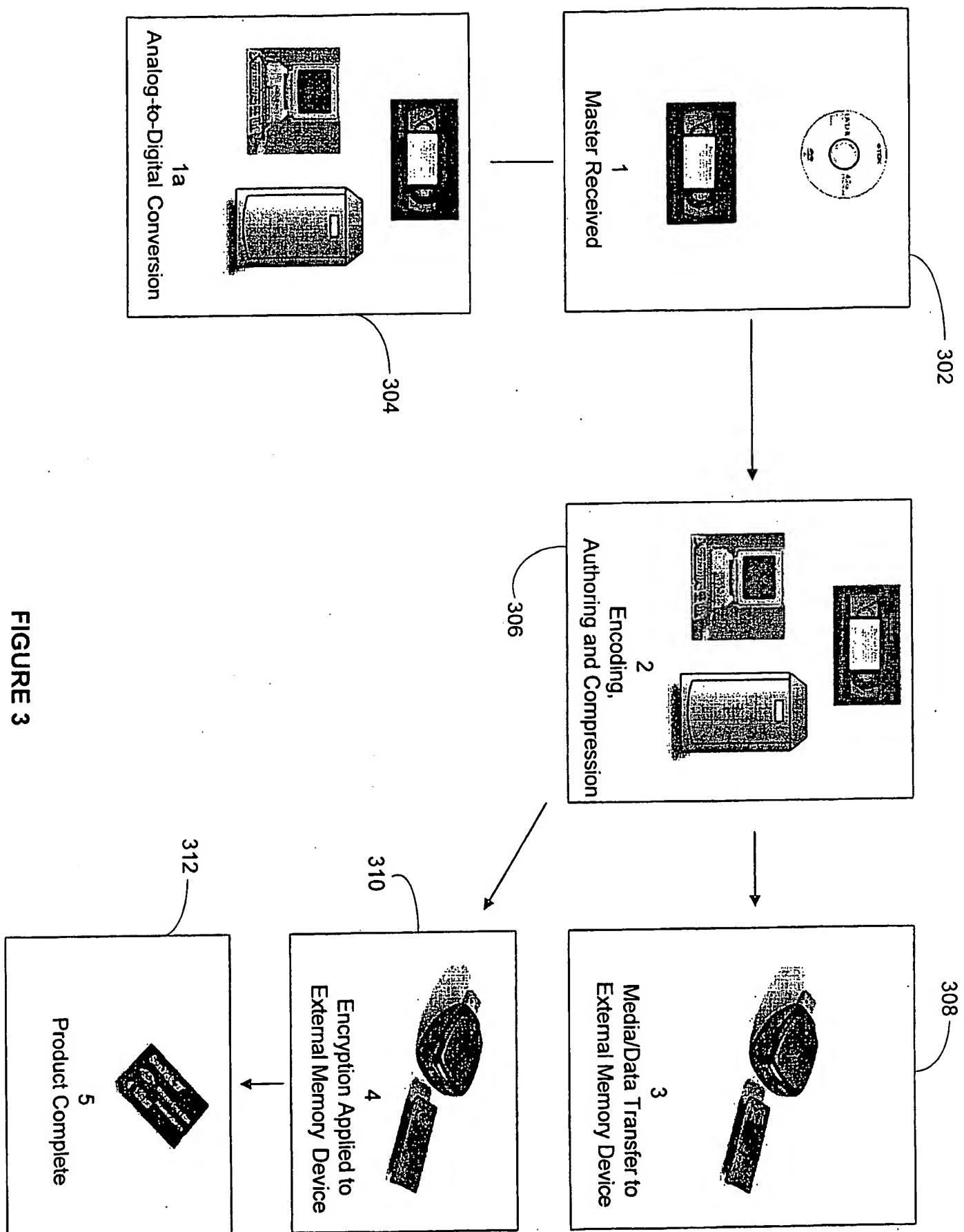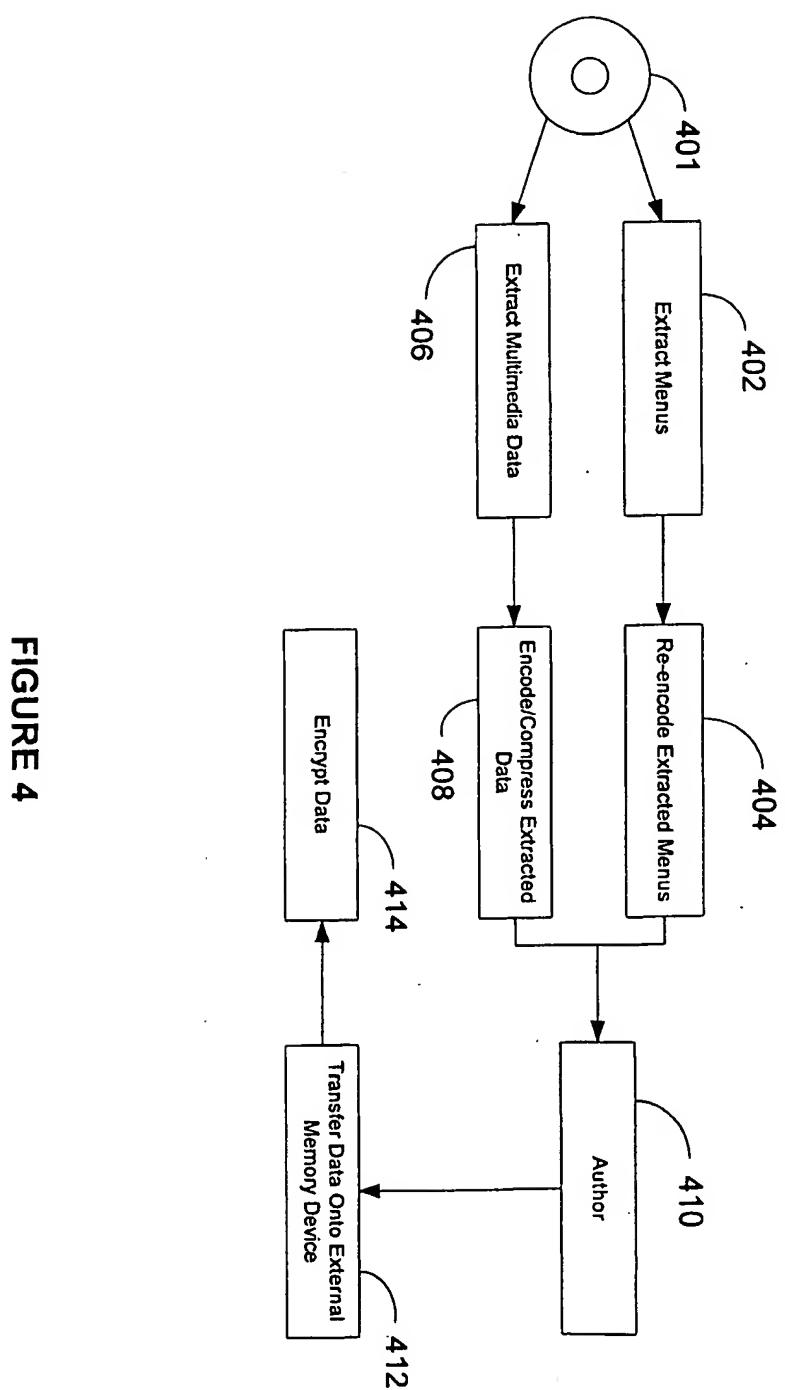
FIGURE 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/36725

A.   CLASSIFICATION OF SUBJECT MATTER

IPC(7)   :   H04K 1/00; H04L 9/00, 9/32

US CL   :   713/189, 193, 200-202; 380/200, 201, 216, 217, 231, 232, 255, 270

According to International Patent Classification (IPC) or to both national classification and IPC

B.   FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
    U.S. : 713/189, 193, 200-202; 380/200, 201, 216, 217, 231, 232, 255, 270
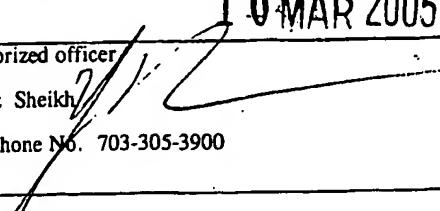
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
Please See Continuation Sheet

C.   DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/0010771 A1 (MANDATO) 24 January 2002, see paragraphs 1, 10, 42, 97, 102, 127, 159, 207, and table 1	1-20

☐ Further documents are listed in the continuation of Box C.   ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 February 2005 (20.02.2005)	1 0 MAR 2005
Name and mailing address of the ISA/US	Authorized officer
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Ayaz Sheikh Telephone No. 703-305-3900

Form PCT/ISA/210 (second sheet) (January 2004)

Continuation of B. FIELDS SEARCHED Item 3:
BRS Text Search (files: USPAT, US PGPUB)

search terms: compress, compression, compressed, compressing, encrypt, encrypted, encryption, encrypting, encode, encoded, encoding, mulitmedia, mobile, author, authorization, authorizing, authorized, authorize